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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/845,945	04/30/2001	Poh Boon Phua	1085-022-PWH	3317

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EXAMINER

JACKSON, CORNELIUS H

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 05/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/845,945

Applicant(s)

PHUA ET AL.

Examiner

Cornelius H. Jackson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.


- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,5-12 and 16-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5-12 and 16-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

  
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## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Acknowledgment***

1. Acknowledgment is made that applicant's Amendment, filed on 03 February 2003, has been entered. Upon entrance of the Amendment, claims 1, 5, 8, 9, 12, 16, 19 and 20 were amended, claims 2-4 and 13-15 were cancelled. Claims 1, 5-12 and 16-22 are now pending in the present application.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 5-12 and 16-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 1 and 12 all claim that the Tm:YAG sample is substantially within the resonant cavity. First, the Tm:YAG sample is either within or outside of the resonant cavity. Second, if the Tm:YAG sample is within the resonant cavity, it is unclear how the Nd:YAG sample pumps the Tm:YAG sample. Claims 5-11 and 16-22 are rejected for depending on an indefinite base claim.

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5. Claims 9 and 20 all claim that the second pair of members is substantially within the resonant cavity. First, the Tm:YAG sample is either within, outside of or forms the boundaries of the resonant cavity.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Jackson et al. "Efficient Gain-Switched Operation of a Tm-Doped Silica Fiber Laser". Jackson discloses a device **Fig. 6** for producing laser radiation having a wavelength of about 2  $\mu\text{m}$ , **see page 779, section I., first paragraph**, comprising a Tm:YAG sample (**Tm-doped Silica Fibre**); and a source of pumping radiation having a wavelength of 1  $\mu\text{m}$ , the source of pumping radiation comprising a resonant cavity composed of a Nd:YAG (**Nd:YAG**) sample and a first pair of members that are reflective to radiation having a wavelength of about 1  $\mu\text{m}$ , the Nd:YAG sample being interposed between the first pair of members, the resonant cavity having the Tm:YAG (**Tm-doped Silica Fibre**) sample located therein, and the source being arranged so that at least some of the radiation produced thereby is absorbed by the Tm:YAG sample (**Tm-doped Silica**

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**Fibre)**, causing the Tm:YAG (**Tm-doped Silica Fibre**) sample to emit radiation having a wavelength of about 2  $\mu\text{m}$ .

Regarding claim 12, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, the rejection used against the device, stands for the method as well.

Regarding claims 5 and 16, Jackson et al. disclose the source of pumping radiation for the Nd:YAG sample to stimulate the Nd:YAG sample to emit radiation having a wavelength of about 1  $\mu\text{m}$ .

Regarding claims 8 and 19, Jackson discloses the Tm:YAG sample is interposed between a second pair of members (**a Steering Mirror and the High Reflector**), at least one of which is reflective to radiation having a wavelength of about 2  $\mu\text{m}$ .

Regarding claims 9 and 20, Jackson discloses the second pair of members located within the source of radiation having a wavelength of about 1  $\mu\text{m}$ , **see page 779, section I., first paragraph.**

Regarding claims 10 and 21, Jackson discloses the stated limitation, **see page 779, section I., first paragraph.**

Regarding claims 11 and 22, Jackson discloses the source of radiation **100** having a wavelength **102** of 1.064  $\mu\text{m}$ , **see page 779, section I., first paragraph.**

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 5-12 and 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zayhowski (6400495) in view of Hanna et al. "Efficient High-Power Continuous-Wave Operation of Monomode Tm-Doped Fibre Laser at 2  $\mu$ m Pumped by Nd:YAG Laser at 1.064  $\mu$ m". Zayhowski teaches a device **Fig. 1**, comprising a solid-state YAG sample **143**; and a source of pumping radiation having a wavelength of 1  $\mu$ m, the source of pumping radiation comprising a resonant cavity composed of a Nd:YAG sample **141** and a first pair of members **131,132** that are reflective to radiation having a wavelength of about 1  $\mu$ m, the Nd:YAG sample **141** being interposed between the first pair of members, the resonant cavity having the solid-state YAG sample **143** located therein, and the source being arranged so that at least some of the radiation produced thereby is absorbed by the solid-state YAG sample **143**, causing the solid-state YAG sample **143** to emit radiation having a wavelength of about 2  $\mu$ m, **see col. 2, lines 39-58**. Zayhowski fails to teach the solid-state YAG sample is doped with Tm, instead, Zayhowski teaches/claims the YAG sample to be a matter of obvious design choice selected by one of ordinary skill in the art at the time the invention was made on the basis to produce a laser with a desired wavelength, **see col. 6, lines 18-24 and claims**

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**1, 9 and 10.** Hanna teaches a Nd:YAG laser pumping Tm ions to produce an output wavelength of 2  $\mu\text{m}$  has been well known in the art since 1989, **see entire document.**

Regarding claim 12, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, the rejection used against the device, stands for the method as well.

Regarding claims 5 and 16, Zayhowski teaches the source of pumping radiation for the Nd:YAG sample to stimulate the Nd:YAG sample to emit radiation having a wavelength of about 1  $\mu\text{m}$ , **see col. 2, lines 39-58.**

Regarding claims 6, 7, 17 and 18, Applicant teaches that "it is conventional to provide an array of appropriately-tuned laser diodes", **see page 2, lines 6-7.**

Regarding claims 8 and 19, Zayhowski teaches the solid-state sample is interposed between a second pair of members **133, 134**, at least one of which is reflective to radiation having a wavelength of about 2  $\mu\text{m}$ , **see Fig. 1.**

Regarding claims 9 and 20, Zayhowski teaches the second pair of members **133, 134** located within the resonant cavity, **see Fig. 1.**

Regarding claims 11 and 22, Zayhowski teaches all the stated limitations, **see col. 2, lines 39-58.**

### ***Response to Arguments***

10. Applicant's arguments, filed 03 February 2003, with respect to the rejection(s) of claim(s) 1, 5-12 and 16-22 have been fully considered and are partially persuasive, due

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to claims being amended. Therefore, the rejection has been withdrawn and a new ground(s) of rejection has been made.

Applicant argued the following:

- a. Jackson et al. does not constitute what one of ordinary skill would fairly consider the use of Tm:YAG as claimed.
- b. Nothing in the art of record contemplates or suggests an attempt to pump a Tm:YAG laser with a 1064 nm Nd:YAG laser.

Examiner's replies to Applicant's arguments are as follows:

- a. It is inherent that for maximum gain efficiency of the pumped sample, one of ordinary skill, at the time the invention was made, would have use the same base material in the pumped laser as used in the pumping laser.
- b. The art of record contemplates or suggests an attempt to pump the Tm ions within a sample with a 1064 nm Nd:YAG laser. There is nothing in Applicant's specification that suggests or teaches that the use of a YAG host yields any benefit or an unexpected result.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cornelius H. Jackson whose telephone number is (703) 306-5981. The examiner can normally be reached on 8:00 - 5:00, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

CHJ

chj

April 24, 2003

*Paul Ip*

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